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(54) **MARKERS TO PREDICT MACROCYCLIC LACTONE DRUG RESISTANCE IN DIROFILARIA IMMITIS, THE CAUSATIVE AGENT OF HEARTWORM DISEASE**

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CPC ..... **C12Q 1/6883** (2013.01); **C12Q 1/6888** (2013.01); **C12Q 2600/124** (2013.01); **C12Q 2600/136** (2013.01); **C12Q 2600/156** (2013.01)

(58) **Field of Classification Search**  
None

See application file for complete search history.

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(57) **ABSTRACT**

Disclosed are nucleic acid molecules from the genome of *Dirofilaria* spp. nematodes that contain single nucleotide polymorphisms related to reduced responsiveness of the nematodes to macrocyclic lactones. In one example, the species of *Dirofilaria* is *Dirofilaria immitis* (the agent of heartworm in animals). Also disclosed are methods for determining the responsiveness of *Dirofilaria* spp. nematodes to macrocyclic lactones, methods for selecting a treatment to treat an animal infected with a *Dirofilaria* spp. nematode, and kits for determining the responsiveness of *Dirofilaria* spp. nematodes to macrocyclic lactones.

**5 Claims, 29 Drawing Sheets**